



January 13, 2014

L-2014-004
10 CFR 50.73

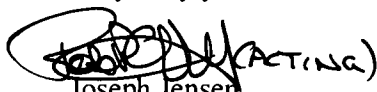
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: 2013-004-00
Date of Event: November 14, 2013

Manual Trip Following Spurious Closure of Main Feedwater Isolation Valve (MFIV) and Lowering of Steam Generator Levels.

The attached Licensee Event Report 2013-004-00 is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,


Joseph Jensen
Site Vice President
St. Lucie Plant

JJ/dlc
Attachment

IE22
NRR

LICENSEE EVENT REPORT (LER)

1. FACILITY NAME St. Lucie Unit 2	2. DOCKET NUMBER 050000389	3. PAGE 1 OF 3
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4. TITLE
Manual Trip Following Spurious Closure of Main Feedwater Isolation Valve (MFIV) and Lowering of Steam Generator Levels

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	14	2013	2013	- 004	- 00	01	13	2014	FACILITY NAME	DOCKET NUMBER

9. OPERATING MODE 1	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)			
10. POWER LEVEL 100%	<input type="checkbox"/> 20.2201(b)	<input type="checkbox"/> 20.2203(a)(3)(i)	<input type="checkbox"/> 50.73(a)(2)(i)(C)	<input type="checkbox"/> 50.73(a)(2)(vii)
	<input type="checkbox"/> 20.2201(d)	<input type="checkbox"/> 20.2203(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(ii)(A)	<input type="checkbox"/> 50.73(a)(2)(vii)(A)
	<input type="checkbox"/> 20.2203(a)(1)	<input type="checkbox"/> 20.2203(a)(4)	<input type="checkbox"/> 50.73(a)(2)(ii)(B)	<input type="checkbox"/> 50.73(a)(2)(vii)(B)
	<input type="checkbox"/> 20.2203(a)(2)(i)	<input type="checkbox"/> 50.36(c)(1)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(ix)(A)
	<input type="checkbox"/> 20.2203(a)(2)(ii)	<input type="checkbox"/> 50.36(c)(1)(ii)(A)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)(A)	<input type="checkbox"/> 50.73(a)(2)(x)
	<input type="checkbox"/> 20.2203(a)(2)(iii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(v)(A)	<input type="checkbox"/> 73.71(a)(4)
	<input type="checkbox"/> 20.2203(a)(2)(iv)	<input type="checkbox"/> 50.46(a)(3)(ii)	<input type="checkbox"/> 50.73(a)(2)(v)(B)	<input type="checkbox"/> 73.71(a)(5)
	<input type="checkbox"/> 20.2203(a)(2)(v)	<input type="checkbox"/> 50.73(a)(2)(i)(A)	<input type="checkbox"/> 50.73(a)(2)(v)(C)	<input type="checkbox"/> OTHER
<input type="checkbox"/> 20.2203(a)(2)(vi)	<input type="checkbox"/> 50.73(a)(2)(i)(B)	<input type="checkbox"/> 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

NAME Donald Cecchett - Principal Engineer, Licensing	TELEPHONE NUMBER (Include Area Code) 772-467-7155
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURE	REPORTABLE TO EPIX
B	JB	RLY	GO80	YES					

14. SUPPLEMENTAL REPORT EXPECTED

☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE)
☒ NO

15. EXPECTED SUBMISSION DATE

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On November 14, 2013 Unit 2 was in Mode 1 at 100 percent power when the 2B Steam Generator Train A main feedwater isolation valve (MFIV) HCV-09-2A spuriously stroked closed. This resulted in a manual reactor trip of Unit 2 due to rapidly lowering steam generator water level. The reactor trip was normal and uncomplicated. All safety related systems functioned as designed. There were no automatic safety system actuations as a result of the trip.

The MFIV closure was a result of corrosion of two relays (3Y/671 or 20X/671) located inside the relay box caused by internal water intrusion in the conduits.

Immediate corrective actions included replacing the degraded relays and installing internal conduit seals. An immediate extent of condition inspection and replacement resulted in installation of conduit seals and replacement of three degraded relays. This event is reportable pursuant to 10 CFR 50.73(a)(2)(iv)(A) as a manual actuation of reactor protection system (RPS). All plant systems responded as designed and there was no safety significance associated with this event.

LICENSEE EVENT REPORT (LER)
CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
St. Lucie Unit 2	05000389	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	Page 2 of 3
		2013	- 004	- 00	

NARRATIVE

Description of the Event

On November 14, 2013 Unit 2 was in Mode 1 at 100 percent power when the 2B steam generator level began lowering rapidly. At 50 percent narrow range level, the Operators manually tripped the Unit 2 reactor in accordance with operation procedures.

During a post trip review the MFIV (HCV-09-2A) was found closed which resulted in the lowering of the steam generator level in 2B steam generator. Subsequent stroking of the MFIV open and closed indicated no unusual indications. Based on valve position data obtained from the distributed control system (DCS), the valve began to 'slow close' at 12:14:36 and was fully closed at 12:18:27. The Unit 2 MFIVs have both a fast close and slow close mode. The slow close mode is used for testing, however systematic troubleshooting of the valve control circuit determined that the spurious slow close actuated as a result of a faulty relay.

Cause

Troubleshooting of the valve control circuit determined the spurious slow closure was a result of corrosion of two relays (3Y/671 or 20X/671) located inside the relay box caused by internal water intrusion in the conduits.

Contributing causes included degradation of control relays and failure to take appropriate action in identifying and eliminating moisture intrusion.

The relevant condition identified during this event was water intrusion into an outdoor electrical box. The extent of condition was defined as outdoor enclosures that may be wetted due to water intrusion. The scope was based on the existing environmental qualification scoping for outdoor boxes in the steam trestle areas.

Analysis of Safety Significance

The safety function of HCV-09-2A is to close in response to a main steam isolation signal, or an auxiliary feedwater actuation signal. Spurious closure of HCV-09-2A isolated feedwater to the 2B steam generator, resulting in lowering level. When lowering steam generator level was approaching the 50 percent narrow range operating limit, a manual trip was initiated in accordance with site procedure. The trip was uncomplicated and the Unit 2 risk remained Green. The auxiliary feedwater actuation system (AFAS) actuated on low steam generator narrow range level as expected for the plant conditions during the event. All safety related systems functioned as designed. There were no automatic safety system actuations as a result of the trip.

This reactor trip event is reportable pursuant to 10 CFR 50.73(a)(2)(iv)(A) as a manual actuation of reactor protection system (RPS). All plant systems responded as designed and there was no safety significance associated with this event.

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1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
St. Lucie Unit 2	05000389	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	Page 3 of 3
		2013	- 004	- 00	

NARRATIVE

Immediate Corrective Actions

1. The degraded relays were replaced, and additional relays were also conservatively replaced
2. Internal conduit seals were installed in the conduits entering this relay box
3. An extent of condition inspection for the other MFIV relay boxes was performed and similar actions were completed for other boxes deemed to be susceptible to moisture intrusion.

Corrective Actions

The corrective actions listed below are entered into the site corrective action program. Any changes to the actions will be managed under the corrective action program.

- Track completion of the forensic evaluation of relays and review the results for any additional corrective action recommendations.
- Incorporate additional guidance in the periodic inspections of electrical boxes and cabinets for identifying and documenting the nature and source of water intrusion. The guidance shall include the incorporation of a water intrusion source identification form for evaluation.
- Increase the frequency of MFIV Relay Box Inspections from a 72-month PM to an 18-month PM.

Similar Events

An operating experience search was performed using the INPO website. None of the OE identified was related to an MFIV event. The industry corrective actions were reviewed for potential applicability to the HCV-09-2A spurious closure event: The main theme present in the industry corrective actions is to identify and correct the source of water intrusion.

Failed Component(s)

Model No. 12HGA11J2 - HFA Relay

Manufacture: General Electric